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«WoodPress»

Pressed timber manufacturing machine

SPPB-6F machine

Operating manual

Naryshkino village, 2021r.

FOREWORD

Thank you for purchasing the SPPB- 6F pressed timber manufacturing machine. We are confident that this purchase will significantly improve your plant's efficiency and productivity. We have prepared this manual to help you resolve technical issues related to equipment operation and maintenance. If you have any questions about the equipment you have purchased, please contact your dealer or us directly.

CONTENTS

1-General information and machine design

2-Transportation of the machine

3-Assembly and first start-up of the SPPB- 6F machine

4-Setting up and adjusting the machine

5-Troubleshooting

6-Safety when working on the machine

1. General information and design

SPPB- 6F
machine is designed for the manufacture of pressed timber of the specified size. Taking into account the specifics of maintaining density of the finished product, size tolerance of +/-2mm is considered to be normal. Pre-mixed blend of sawdust with urea-formaldehyde resin (KFMT-15) is a raw material used for manufacture. During production, the raw material enters the stirrer tank, from where it enters the heated draw die and is pressed by the piston. Under the influence of temperature and pressure, the blend acquires required shape, density and polymerizes. At the exit from the dies, the finished product is cut to size using trimming complexes (if available) and placed on a pallet

In principle, SPPB- 6F machine consists of 3 components: 1Hydraulic station, 2 Press, 3 Trimming complex.

2. Transportation of the SPPB- 6F machine

The machine is transported disassembled into 4 components: 1-Hydraulic station, 2-Press, 3Trimming complex, 4-Trimming saw.

- Transportation of the entire set of equipment is carried out by enclosed means of transport to avoid moisture ingress into the electrics.

- All components of the SPPB-4 machine shall be secured properly to exclude the possibility of falling.

- It is necessary to ensure availability of a firm and even surface under the press during transportation.

- Loading and unloading operations shall be carried out with textile slings to avoid violation of the paint layer.

- Personnel performing loading and unloading operations shall know general safety requirements and comply with them.

3. Assembly and first start-up of the SPPB-6F machine

Installation and preparation for the first start-up shall occur in the following sequence:

- Press shall be placed in the required area inside the production site. A firm and even base under the press shall be provided. Unevenness of the base can lead to violation of machine geometry and piston "biting" inside the draw die.

  – Hydraulic station shall be installed in a convenient area near the press, taking into account high-pressure hose length (length of hoses and electrical wiring may be increased if it is necessary to move the hydraulic station away from the press)

- Hydraulic station shall be filled with oil to the middle of the level. We recommend using hydraulic oil of Grade "A", MG 30, MGE 46V as a working fluid.

- Hydraulic station shall be connected to the hydraulic cylinder of the press with the help of high-pressure hoses.

- Electric motor of the hydraulic station shall be connected to the press control station using a 4*2.5mm cable.

- Connectors shall be put on the hydraulic control valve of the hydraulic station according to markings, and they shall be fixed with bolts

- The front support leg shall be mounted on the trimming complex using an M10 bolt with a nut.

- There are 2 fixing holes with bolts on the front of the press frame for installation of the trimming complex. You should use them and connect the trimming complex to the press.

- The trimming saw shall be installed on the trimming unit by installing the saw rotation shaft in the unit seat.

- Cable ties shall be used to secure the trimming saw wire to the unit. The unit seat has a hole for this purpose. Circular saw wire shall be brought down and connected to the prepared 220V power cable.

- 4*10mm power cable shall be connected to the main incoming switch inside the control station

It is necessary to ensure that the density adjustment bolts are loosened during the first start-up.

First start-up.

- The main incoming switch is turned on inside the control station switchboard. Green "mains" lamp will light up on the front panel of the control station, indicating the presence of voltage.

- Then, "external heating element" is switched on from the front panel of the control station. From this moment, the machine begins to warm up to the operating temperature indicated on the thermostat under the stirrer. Note: (1) Operating temperature may vary for each consumer. It depends on the raw materials from which the timber is made and on the desired color of the finished product. We recommend starting at 180°C and further in the operating process selecting the one you need. (2) Machine warm-up time can vary from 30-60 minutes depending on the ambient temperature, initial draw die temperature and mains voltage. You will be notified of the final warming up to the required temperature by a click from the control station switchboard, which means that the starter contacts have opened and heating is no longer in progress.

- When the draw dies reach the required temperature, the "central heating element" switch is turned on

- Green "Stirrer" button shall be pressed to turn on the stirrer blades.

- Oil station shall be started. Note: (1) Operating fluid temperature of the hydraulic station shall be in the delta between 15-80°C. **If temperature exceeds the specified value**, the press can lose its power until it stops completely. In this case, stop working and wait until the fluid cools down to the required values. In order to prevent repetition of this scenario you can use a forced cooling device or transfer the oil station to a colder room. **If the temperature is below the specified value**, the oil station shall be allowed to run without load to heat the fluid. This operating regime is achieved by turning on the oil station without turning on the "limit switches" on the front panel of the control station. In this case, oil station passes fluid through itself without transferring the force to the press. If this action is neglected, the oil will foam and burst out of the oil station tank.

- Piston shall be put into motion by moving the "limit switches" switch to the working position.

- Then it is necessary to start adding the prepared blend to the stirrer tank.

- By tightening/loosening the bolts at the exit of the draw dies, the side plate of the draw die shall be tightened/released to adjust the product density throughout the entire production process.

- In any emergency, you can stop the entire machine by pressing the red "mushroom" button on the front panel.

4. Setting up and adjusting the machine

IT IS IMPORTANT!!!! Never tighten the hydraulic relief valve to avoid rupture of the machine frame. Consequences caused by this action are not covered by the warranty!!!

The machine can be customized to achieve the best product quality and to increase productivity.

A) Operator has the ability to regulate draw die temperature in the range from 0-300°C. High temperature promotes faster polymerization of the adhesive in the blend. But the products will come out in a dark brown, burnt, unmarketable color. Low temperature allows you to make the color of the produced timber as light as possible, with some loss in performance. Finding the optimum temperature is the direct responsibility of the operator. Adjustment shall be made by means of a regulator located on the machine frame under the stirrer tank.

B) Operator can also regulate the power of the central heating element. The principle is the same: a balance shall be found between maximum temperature (to increase productivity) and preservation of the product's marketable appearance. Power of the central heating element shall be adjusted by means of a regulator inside the control station switchboard, marked with the corresponding inscription.

C) Delay period can be adjusted when the piston is in the maximum rear position and the receiving holes are open for feeding of raw materials into the draw dies. Depending on the quality of raw materials, the delay can be removed altogether, thereby increasing the number of piston strokes, OR set for a longer period to ensure high-quality loading of "complex" raw materials. This adjustment shall be made inside the control station switchboard on a digital delay relay (instructions for use are attached to the machine)

D) IMPORTANT!!! The main type of adjustment is product density regulation. The reference density is considered to be 600 kg/m^3. The direct and most important task of the operator is to keep density close to the reference value. This adjustment shall be carried out constantly during the entire operation of the machine, by tightening and loosening the adjustment bolts. When tightening the adjustment bolt, the operator shall press on the side wall of the draw die, thereby narrowing the opening, which results in an increase in the required pressure for pushing the timber, and, accordingly, increasing its density. When releasing the adjustment bolt, the opening increases and the pressure that shall be applied to push the timber through decreases, which leads to a decrease in density.

When carrying out this operation, it is necessary to understand that given the rate of product output, the final result in terms of density obtained after exposure can be seen in 5-10 minutes. Therefore, we do not recommend to hurry, rather take a restrained attitude to the adjustment process.

An important detail:

Of course, all customers have different raw materials. They differ in type (pine needles, hardwood, etc.), fraction, density, quality of the adhesive used. But still, the average pressure that the machine should reach at the moment of pressing shall fluctuate in the range of around 3550 atmospheres. Therefore, if the operator noticed a drop in peak pressure below the specified one, this is a clear sign to tighten the adjustment bolt without waiting for the defective timber to come out.

(!) We recommend using the machine in the round-the-clock operation mode. With this mode, there is no need to warm up the machine and constantly adjust the density.

5. Troubleshooting.

№	Description of the fault	Required actions
1	Oil from the hydraulic station foamed and began to pour out	Oil was not preheated to 15 degrees. It is necessary to wait for 2-3 hours, fill up the spilled amount of fluid, warm up the oil at idle and start working
2	Hydraulic station works, but the piston does not move	It is necessary to check whether the "limit switches" toggle switch on the front panel is enabled Tightness of the hydraulic relief valve shall be checked

3	Piston is stuck in one of the extreme positions and does not go back	Actuation of the limit switchand reliability of its mechanical mounting to the frame shall be checked
4	The finished timber bends and turns to one side	Connection and performance of external heating elements shall be checked
5	There is too much smoke coming from the central hole of the timber	Power of the central heating element shall be reduced in the control station switchboard
6	Smoke does not come from the central hole at all, and timber is wet closer to the center	Operability of the central heating elements shall be checked and, if necessary, they shall be replaced.
7	Contacts of external heating elements click with high frequency	Capillary sensor shall be moved away from the external heating element. If there is no result, the capillary thermostat shall be replaced

6. Safety when working on the machine

Machine is equipped with a set of protective devices that allow the operator to avoid injury and that can save machine from damage. Operator shall first learn the safety rules before starting to operate the machine.

1.1 Requirements for the operator and maintenance personnel.

Operator shall be specially trained to operate this machine. Before operating, the operator shall carefully read the "Operating Manual" and fully understand the content; the operator shall not start operation until he is able to operate the machine professionally. Requirements of the "Safety Rules" shall be read before starting the operation. Operator shall wear protective clothing and safety shoes; long hair shall be tucked under the headgear.

1.2 Main operations

Caution:

- Never touch transformers, electric motors, or terminals that are under high voltage to avoid electric shock.

- Do not touch the switches with wet hands to avoid electric shock. Remember: The workspace shall be large enough for safety reasons. There shall be a separate ground line, and it shall be short.

- Operator shall know where the emergency stop button is so that he can use it if necessary. In the event of a malfunction, the button shall be pressed first and then the main power switch shall be turned off. Power shall not be turned on before the problem is resolved. If there is a power failure, the main power

switch shall be turned off. Floor around the machine shall be dry and clean, free from oil and water.

– Switches shall not be operated at random, in a disorderly manner. Only recommended oil and grease shall be used.

1.3 Requirements before turning on power

Attention: Cable, wire and grounding shall be checked before turning on the power, as damage to the insulation may result in electric leakage and electric shock. Wiring diagram (electrical equipment) shall be checked carefully before turning on the power to make sure that no moisture has entered the engine.